AMENDMENTS TO THE CLAIMS

1.   (Currently Amended) A proactive user interface for a computational device, the computational device having an operating system, comprising:

(a)   an ~~user~~ interface unit for communicating between a ~~the~~ user and said operating system; and

(b)   a learning module for detecting at least one pattern of interaction of the user with said ~~user~~ interface unit and for proactively altering at least one function of said ~~user~~ interface unit according to said detected pattern.

2.   (Currently Amended) The proactive user interface of claim 1, wherein said at least one pattern is selected from the group consisting of a pattern determined according to at least one previous interaction of the user with said ~~user~~ interface unit, and a predetermined pattern, or a combination thereof.

3.   (Currently Amended) The proactive user interface of claim 1, wherein said ~~user~~ interface unit features a graphical display and said altering at least one function of said ~~user~~ interface unit comprises altering at least a portion of said graphical display.

4.   (Original) The proactive user interface of claim 3, wherein said altering at least a portion of said graphical display comprises:

selecting a menu for display according to said detected pattern; and

displaying said menu.

5.   (Original) The proactive user interface of claim 4, wherein said selecting said menu comprises:

constructing a menu from a plurality of menu options.

6.   (Currently Amended) The proactive user interface of claim 1, wherein said ~~user~~ interface unit features an audio display and said altering at least one function of said ~~user~~

3

interface <u>unit</u> comprises altering at least one audible sound produced by the computational device.

7.   (Currently Amended) The proactive user interface of claim 1, wherein the computational device is selected from the group consisting of a ~~personal~~ <u>regular</u> computer, an ATM, a mobile information devices <u>including a cellular telephone, a PDA</u>, or a consumer appliance having an operating system.

8 – 108 (Cancelled)

109.   (New) The proactive user interface of claim 7, wherein said learning module comprises a knowledge base for holding information gathered as a result of interactions with the user and/or the operating system.

110.   (New) The proactive user interface of claim 109, wherein said knowledge base comprises a plurality of integrated knowledge determined from the behavior of the user and from preprogrammed information.

111.   (New) The proactive user interface of claim 109, wherein said learning module further comprises a plurality of sensors for perceiving a state of the operating system.

112.   (New) The proactive user interface of claim 111, wherein said learning module further comprises a perception unit for processing output from said sensors to determine a state of the operating system and a state of said interface unit.

113.   (New) The proactive user interface of claim 112, wherein said learning module further comprises a reasoning system for updating said knowledge base and for learning an association between an alteration of said interface unit and a state of the operating system.

114.   (New) The proactive user interface of claim 109, wherein said learning module further comprises at least one of an artificial intelligence algorithm and a machine learning algorithm.

115.   (New) The proactive user interface of claim 109, wherein said learning module maximizes a percentage of proactive alterations leading to a direct user selection from said alteration.

116.   (New) The proactive user interface of claim 115, wherein said maximization is performed through learning reinforcement.

117.   (New) The proactive user interface of claim 116, wherein said learning reinforcement is performed through an iterative learning process.

118.   (New) The proactive user interface of claim 117, wherein each iteration of said learning process is performed after said alteration has been performed.

119.   (New) The proactive user interface of claim 1, wherein said proactively altering at least one function of said interface unit comprises activating an additional software application through the operating system.

120.   (New) The proactive user interface of claim 119, further comprising an intelligent agent capable of communicating with a human user.

121.   (New) The proactive user interface of claim 120, wherein said intelligent agent controls at least one interaction of the computational device over a network.

122.   (New) A method for a proactive interaction between a user and a computational device through a user interface, the computational device having an operating system, the method comprising:

5

detecting a pattern of user behavior according to at least one interaction of the user with the user interface by using a learning module; and

proactively altering at least one function of the user interface according to said pattern.

123. (New) The method of claim 122, wherein said at least one pattern is selected from the group consisting of a pattern determined according to at least one previous interaction of the user with said user interface, and a predetermined pattern, or a combination thereof.

124. (New) The method of claim 122, wherein said user interface features a graphical display and said altering at least one function of said user interface comprises altering at least a portion of said graphical display.

125. (New) The method of claim 124, wherein said altering at least a portion of said graphical display comprises:

selecting a menu for display according to said detected pattern; and
displaying said menu.

126. (New) The method of claim 125, wherein said selecting said menu comprises:
constructing a menu from a plurality of menu options.

127. (New) The method of claim 122, wherein said user interface features an audio display and said altering at least one function of said user interface comprises altering at least one audible sound produced by the computational device.

128. (New) The method of claim 122, wherein the computational device is selected from the group consisting of a regular computer, an ATM, a cellular telephone, a mobile information device, a PDA, or a consumer appliance having an operating system.

129. (New) The method of claim 122, wherein said learning module comprises a knowledge base, and the method further comprises holding information gathered as a result of interactions with the user and/or the operating system by using said knowledge base.

130. (New) The method of claim 129, wherein said knowledge base comprises a plurality of integrated knowledge determined from the behavior of the user and from preprogrammed information.

131. (New) The method of claim 129, wherein said learning module further comprises a plurality of sensors, and uses said sensors to perceive a state of the operating system.

132. (New) The method of claim 131, wherein said learning module further comprises a perception unit, and uses said perception unit to process output from said sensors and determine a state of the operating system and a state of said user interface.

133. (New) The method of claim 132, wherein said learning module further comprises a reasoning system, and uses said reasoning system to update said knowledge base and learn an association between an alteration of said user interface and a state of the operating system.

134. (New) The method of claim 129, wherein said learning module further comprises at least one of an artificial intelligence algorithm and a machine learning algorithm, and the method is performed by the learning module.

135. (New) The method of claim 129, wherein said learning module maximizes a percentage of proactive alterations leading to a direct user selection from said alteration.

136. (New) The method of claim 135, wherein said maximization is performed through learning reinforcement.

137. (New) The method of claim 136, wherein said· learning reinforcement is performed through an iterative learning process.

138.　(New) The method of claim 137, wherein each iteration of said learning process is performed after said alteration has been performed.

139.　(New) The method of claim122, wherein said proactively altering at least one function of said user interface comprises activating an additional software application through the operating system.

140.　(New) The method of claim 139, wherein the method is performed using an intelligent agent capable of communicating with a human user.

141.　(New) The method of claim 140, wherein said intelligent agent controls at least one interaction of the computational device over a network.

142.　(New) An adaptive system for a computational device, the computational device having an operating system, comprising:

(a)　a user interface for communicating between a user and said operating system;

(b)　at least one software application controlled by said operating system; and

(c)　an AI (Artificial Intelligence) framework for supporting said application and communicating with a host platform of said operating system.

143.　(New) The adaptive system of claim 142, further comprising a knowledge base for holding information selected from the group consisting of a pattern determined according to at least one previous interaction of the user with said user interface, and a predetermined pattern, or a combination thereof.

144.　(New) The adaptive system of claim 143, wherein said AI framework includes:

an AI/ML (Artificial Intelligence/Machine Learning) module;

an application manager for handling communication with said application;

a storage manager for managing storage and handling of data with regard to the knowledge base of the system;

an action manager for enabling the adaptive system to determine which action should be taken through an operation of the AI/ML module;

a UI (User Interface) manager for managing appearance and functions of the user interface by directing changes to the user interface; and

a device world mapper for determining a state of the computational device, a state of a virtual world, and relationship between said two states.

145. (New) The adaptive system of claim 144, wherein the AI/ML module determines a behavior of the adaptive system in response to various stimuli, and enables the adaptive system to learn from a response of the user to different types of actions.

146. (New) The adaptive system of claim 144, wherein said AI framework further includes an event handler for receiving and handling different events between the application and a plurality of different low level managers, said low level managers including the action manager, the UI manager, the storage manager, and the application manager.

147. (New) The adaptive system of claim 142, wherein the application manager is capable of starting, pausing, resuming and stopping each of said at least one software application.

148. (New) The adaptive system of claim 142, wherein the computational device is selected from the group consisting of a regular computer, an ATM, mobile information devices including a cellular telephone, a PDA, or a consumer appliance having an operating system.

149. (New) The adaptive system of claim 142, wherein said action that should be taken by the adaptive system is performed by an intelligent agent.

150. (New) The adaptive system of claim 149, wherein said intelligent agent is created through a 3D graphic model.

151. (New) The adaptive system of claim 150, wherein said intelligent agent controls an avatar to be displayed independently of visual display aspects of the user interface.

152. (New) The adaptive system of claim 151, wherein said intelligent agent performs a process defined in an application selected from the group consisting of a teaching machine application for providing instruction on a subject which is not related to direct operation of a device itself, a floating agent application for enabling visual display aspects of the user interface to be displayed independently of display of the avatar, and a TC world application for running the intelligent agent.

153. (New) The adaptive system of claim 149, wherein the adaptive system performs direct communication with components of the mobile information device.

154. (New) The adaptive system of claim 153, wherein said direct communication of the adaptive system with the mobile information device is performed when an event occurs, said event being selected from the group consisting of:

a flipper event that occurs when a flipper of the mobile information device is opened or closed;

an inter-application event for allowing applications to optionally send events to each other;

a call event including a call-start event for notifying start of a call and a call-end event for notifying end of a call;

an incoming or outgoing SMS message event including parameters related to hybridization of a creature or avatar of one mobile information device with a creature or avatar of another mobile information device;

a key event related to operation of keys of the mobile information device;

a battery event for handling events related to a battery; and

a day time event related to at least one of an alarm, a calendar and a reminder/appointment diary.

155.   (New) The adaptive system of claim 149, wherein the intelligent agent communicates with an object that is found in a virtual environment.

156.   (New) The adaptive system of claim 155, wherein the object includes at least one of a ball, a good animal, food, a bad animal, a house, and toys.

157.   The adaptive system of claim 155, wherein the object includes a graded input to a state of the intelligent agent.

158.   (New) The adaptive system of claim 156, wherein the object becomes an incentive or disincentive for the intelligent agent to continue a behavior for which feedback has been provided.

159.   (New) The adaptive system of claim 142, wherein said action that should be taken by the adaptive system is determined by a rule based strategy.

160.   (New) The adaptive system of claim 159, wherein said rule based strategy includes:

a) querying a knowledge base when an event occurs, and receiving a response therefrom;

b) determining whether the event is valid or not;

c) generating an action corresponding to the event and determining priority for the action; and

d) performing a highest priority action from among actions corresponding to the event.

161.   (New) The adaptive system of claim 160, wherein the highest priority action is an action that maximizes an aggregated total reward from the virtual environment or a graded input in the form of encouraging or discouraging feedback.

162.   (New) The adaptive system of claim 159, wherein the adaptive system performs textual communication, audio communication and graphical communication with a user.

163.   (New) The adaptive system of any of claim 159, wherein for each phone number, the adaptive system learns an alternative phone number most likely to be dialed with the mobile information device after a call attempt with a certain phone number has failed, and suggests an alternative phone number to be called after a call attempt by a user has failed.

164.   (New) The adaptive system of claim 163, wherein the adaptive system uses the mobile information device's usage statistics and call statistics to learn the device's possible contacts relations and mutual properties, and then automatically groups contact phone numbers based on the learned result.

165.   (New) The adaptive system of claim 163, wherein the adaptive system implements a knowledge base based on the learned result, and then performs a corresponding operation using the knowledge base.

166.   (New) The adaptive system of claim 159, wherein the adaptive system communicates with a biological sensor that automatically senses a current usage state of the mobile information device's user, and the adaptive system automatically changes an operating environment of the mobile information device to suit the detected current usage state.

167.   (New) The adaptive system of claim 166, wherein the adaptive system returns the current usage state of the user to a counterpart after automatically changing the operating environment.

168.   (New) The adaptive system of claim 159, wherein the adaptive system communicates with a sensor capable of identifying user information of the mobile information device, so that the adaptive system automatically identifies said user information of the mobile information device.

169.   (New) The adaptive system of claim 159, wherein, upon receipt of a phone call from a phone number, which is identified as an important phone number by the knowledge base

and/or by information registered by the user of the mobile information device, the adaptive system performs automatic callback to said phone number.

170. (New) The adaptive system of claim 159, wherein the adaptive system predicts an addressee of a newly created message by identifying certain word patterns in an SMS message of the mobile information device.

171. (New) The adaptive system of claim 159, wherein the adaptive system creates a unique and personal User Interface (UI) menu based on specific user preferences and usage of the mobile information device.

172. (New) The adaptive system of claim 171, wherein the personal UI menu features suggestion of a menu item activation shortcut.

173. (New) The adaptive system of claim 171, wherein the personal UI menu features menu item reordering.

174. (New) The adaptive system of claim 171, wherein the personal UI menu features menu composition.

175. (New) The adaptive system of claim 159, wherein the adaptive system allows the avatar to entertain the user.

176. (New) The adaptive system of claim 175 wherein the adaptive system provides a "Hide and Seek" game so that the avatar hides in a menu hierarchy and the user seeks the avatar.

177. (New) The adaptive system of claim 159, further comprising a teaching module for teaching the user.

178.   (New) The adaptive system of claim 177, wherein said teaching module is operative for teaching the user about at least one aspect of the mobile information device.

179.   (New) The adaptive system of claim 177, wherein said teaching module is operative for teaching the user about at least one subject external to the mobile information device.